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Use of the SAW Method as a Determination of Scholarships for Students on Campus

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Abstract— The digital era that has entered the industrial revolution 4.0, of course, facilitates all activities in obtaining information from various media as a support for the ease of information needed. The development of science and technology which is increasingly sophisticated and fast has diverse impacts in almost all sectors of life today. Decision support system in determining scholarships in tertiary institutions by using simple additive weighting (SAW) method to record PPA Scholarships on Universitas Pembangunan Panca Budi Medan students based on websites using PHP programming language and MySQL database, so as to minimize errors arising in handling data PPA scholarship and know the results of the assessment stored in the decision support system application, so it can be concluded the results of decision making. able to produce alternatives. Designing the determination of eligible students to receive a PPA scholarship by means of the total value of the overall weighting criteria of all students applying for PPA scholarship from Panca Budi University, Medan.

Keywords: Scholarship, Media, SAW, MySQL.

I. INTRODUCTION

Strategies developed by the government that include government policies, service quality, development access to capital, and construction of school facilities, construction of facilities and infrastructure, skills development and technology mastery is expected to be solutions that need to be done through a comprehensive strategy with place socio-economic systems and cultural values that have been embedded in community as a driver of change [1]. Use Science technology that is increasingly sophisticated and fast in its development makes a huge and varied impact on all sectors including government, education, trade and others. Part of the industrial revolution era 4.0 which made it easier to obtain information on each activity through the media. The Directorate General of Higher Education Ministry of National Education seeks to allocate funds to provide scholarships for students whose economies cannot afford to finance their education, and provide scholarships to students who have achievements.

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So that the scholarship program can be implemented in accordance with the right target, the right amount and on time. and prioritize the selection of the best teachers based on their performance. This decision support system applies the Simple Additive weighting (SAW) method to determine the priorities of the best teachers. The concept of the SAW method is to find a weighted sum of performance rankings for each alternative (teacher) on all attributes, using the System Development Life Cycle (SDLC) development method which consists of analysis, design, code, testing, and maintenance implemented with a programming language. PHP and MySQL. The decision support system using the SAW method is useful to help the PKG team grow the best priorities for effective and efficient teacher assessment based on the results of the blackbox test, comparison and analysis of the usefulness of the system user response [2].

Provision of learning assistance in the form of scholarships is given to students at Panca Budi University, Medan, among others who excel. In determining the acceptance of scholarships have used computer assistance, but its use has not been optimal. This results in inefficient management of scholarship data, especially in terms of time and the number of repetitions of processes that can actually be streamlined, therefore, there is a need for a decision support system to facilitate the calculation of all the criteria that support the determination of scholarships, so as to shorten the completion time and increase the quality of decisions in determining scholarship recipients. Decision support systems are also computer-based information systems for decision-making management that address semi-structured problems. Decision support system in determining scholarships for students of Panca Budi Medan by using the Simple Additive Weighting method to ask the criteria displayed in the form of questions about scholarship determination for students [3].

Differences in various regional conditions have implications for the pattern of development that will be applied.Imitation of a policy pattern that is successfully applied to one region, not necessarily the results can provide the same benefits to other regions. The emphasis of development policy must be adjusted to the characteristics of the region by utilizing the potential of natural resources, human resources, and institutions. The creative economy that is currently developing, especially supported by the digital era, provides significant opportunities for the regional economy to be developed with a variety of renewable resources. According to Helmsing (2001) [3] The current local economy is implemented in the form of partnership partnerships between local governments,

communities and the private sector established to manage existing resources to create renewable employment opportunities and boost the economy in various regions. This explains that the management of the small home industry, by exploiting the potential

II. EASE OF USE

Based on the background of the problem outlined, the formulation of the problem in this study is:

1. How to design a decision support system in determining scholarships for Panca Budi University Students Medan using the SAW method?
2. How can this system help Universitas Panca Budi Development Medan in determining students who are eligible for scholarships?

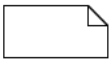
The benefits of this research are as follows:

1. To facilitate decision making at Panca Budi University, Medan, which will help the Student Affairs Department to determine students who are entitled to receive scholarships.
2. To facilitate the student affairs section in determining students who deserve a scholarship in accordance with the ranking value that has been obtained.

III. REVIEW CRITERIA

According To Indrajani (2015: 31)[3], The Symbols Of The Use Case Are As Follows:

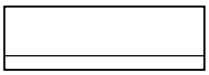
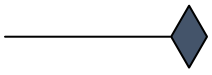
Tabel 2.1. Simbol Use Case Diagram

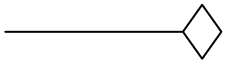
No	Picture	Name	Information
1		*Actor*	Specifies the set of roles users play when interacting with use cases.
2		*Dependency*	Relationships where changes occur in an independent element (independent) will affect the elements that depend on the elements that are not independent.
3		*Generalization*	A relationship in which a child object (descendent) shares the behavior and data structure of an object that is on it the parent object (ancestor).
4		*Include*	Specifies that the source use case is explicit.
5		*Extend*	Specifies that the target use case expands the behavior of the source use case at a given point.
6		*Association*	What connects one object to another.
7		*System*	Specifies packages that display the system in a limited way.
8		*Use Case*	Description of the sequence of actions displayed by the system that produces a measurable result for an actor
9		*Collaboration*	Interaction of rules and other elements that work together to provide behavior that is greater than the sum and its elements (synergy).
10		*Note*	Physical elements that exist when an application is run and reflect a computational resource

Tabel 2.2. Simbol Activity Diagram

No	Picture	Name	Information
1		*Actify*	Shows how each interface class interacts with each other
2		*Action*	The state of the system that reflects the execution of an action
3		*Initial Node*	How objects are formed or initiated.
4		*Actify Final Node*	How objects are formed and destroyed
5		*Fork Node*	One flow that at a certain stage turns into several streams

Table 2.3. Symbol used in Class Diagrams

Simbol	Nama	Fungsi
	*Class*	Menggambarkan *Class* baru pada diagram.
	Association	Menggambarkan relasi antar asosiasi
	*Composition*	Jika sebuah *class* tidak bisa berdiri sendiri dan harus merupakan bagian dari *class* yang lain, maka class tersebut memiliki relasi *Composition* terhadap *class* tempat dia bergantung tersebut.
	Depedency	Umumnya penggunaan *dependency* digunakan untuk menunjukkan operasi pada suatu *class* yang menggunakan *class* yang lain.

	*Aggregation*	*Aggregation* mengindikasikan keseluruhan bagian *relationship* dan biasanya disebut sebagai relasi.

IV. RESEARCH METHODS

This stage is carried out to discuss the calculation of the weighting of the criteria on each alternative to determine the PPA scholarship for Panca Budi University Students Medan using the SAW method. Based on the results of the problem analysis, it can be concluded that a decision support system application is needed to determine the PPA scholarship for students of the Panca Budi University of Medan-based Web Development. Facts and knowledge are taken from observations in the academic section at the Panca Budi Development University, Medan. Facts and knowledge that has been obtained will be translated by the system maker or knowledge engineer into the knowledge base stored in the decision support system made. Some shortcomings of the system that is running are.

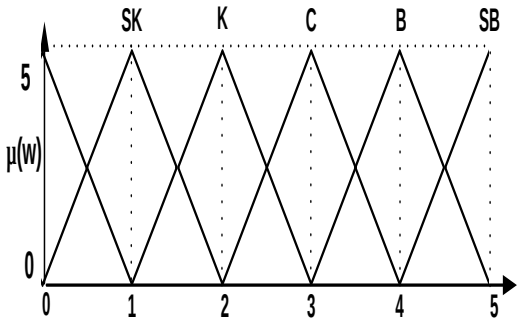


Figure 4.1 Weight Graph

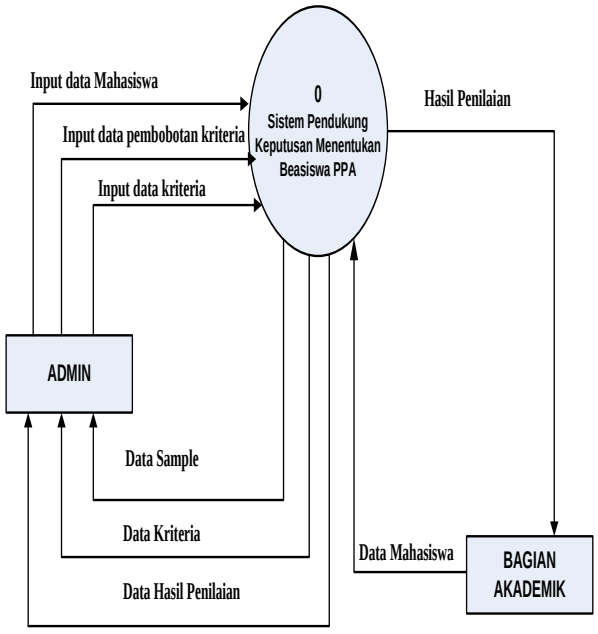


Figure 4.2 DFD Level 0 SPK Design Determine PPA Scholarship

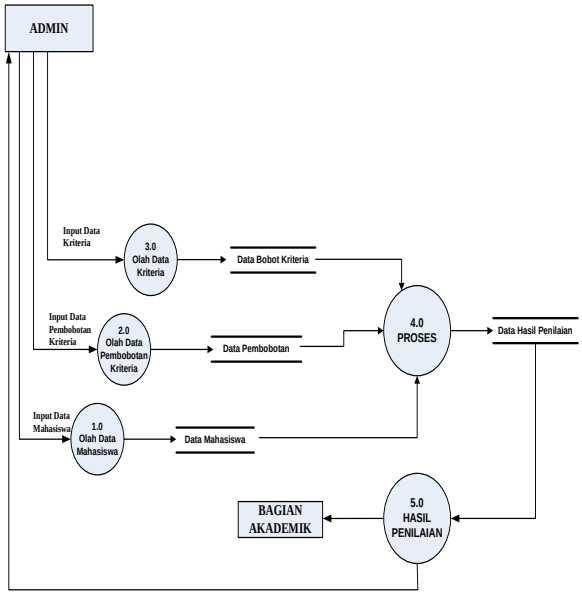


Figure 4.4 Entity Relationship Database

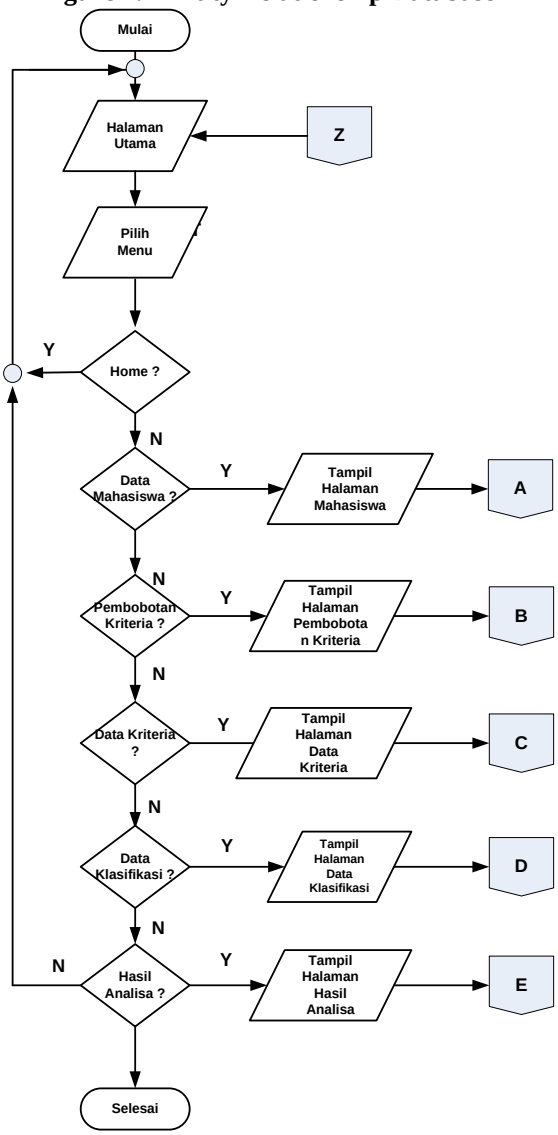


Figure 4.5 Flowchart Admintrasi page

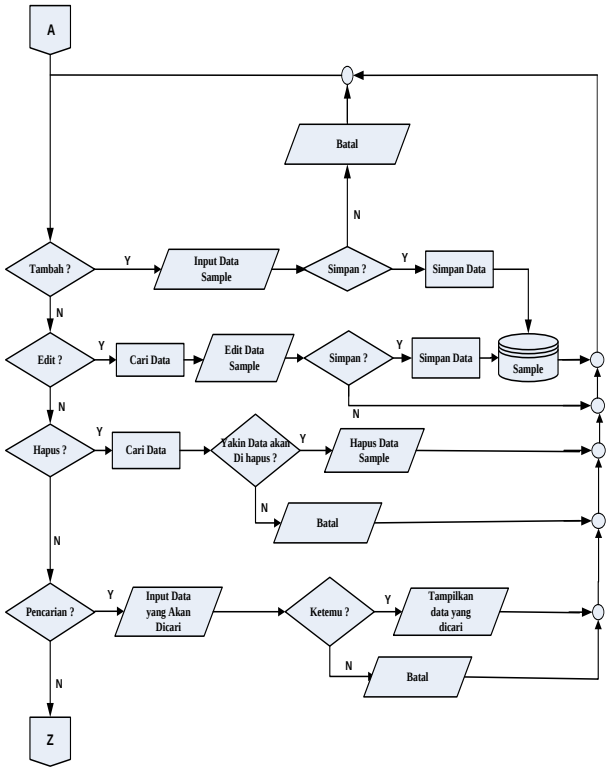


Figure 4.6 Student Data Flowchart

V. RESULTS AND TESTING

The page that is accessed when the application is run after the login process when the application is run, on the login page, the user will be asked to enter a username and password to enter the decision support system to determine the PPA scholarship for Panca Budi University Students Medan using the SAW method.

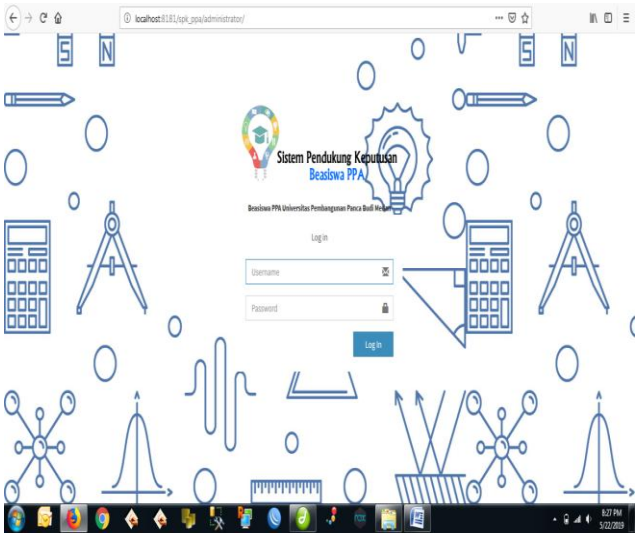


Figure 5.1. Web application test results in a browser

The page that is accessed after logging in when the application is run is the Home page as the main page of the decision support system determining the PPA scholarship for Panca Budi University Students Medan using the SAW method. The home page consists of student data menus, study program data, weighting criteria, criterion data, classification data and analysis report results.

Table 4.1 Testing Table of Decision Support System Determining PPA Scholarship for Universitas Pembangunan Panca Budi Students Medan

Decision Support System Testing Results Determine Student PPA Scholarships Using Black Box Testing				
No	**Case Get tested**	**Test Scenarios**	**Desired Results is expected**	**Test result Testing**
1.	Student Menu	Select the Student Data Menu	Showing Student Data	[√] Was successful [ ] Not Was
2	Study Program Menu	Choose Study Program Menu	Showing Study Program Data	[√] Was successful [ ] Not Was successful
3	Criteria Menu	Select the Criteria Menu	Showing Criteria Data	[√] Was successful [ ] Not Was successful
4	Criteria Weighting Menu	Select the Criteria Weighting Menu	Showing Criteria Weighting Data	[√] Was successful [ ] Not Was successful
5	Classification Assessment Menu	Select the Classificatio n Data Menu	Showing Classification Rating Data	[√] Was successful [ ] Not Was successful
6	Analysis Reports Menu	Select the Analysis Results Report Menu	Showing Data Analysis Reports	[√] Was successful [ ] Not Was successful

Based on the results of the implementation of the decision support system program that has been made, researchers found the strengths and weaknesses of the application of the Simple Additive Weighting Method in the Decision Support System Determine the export quality coffee beans produced.

1. System Strengths

The advantages of the system being built include:

a) Application of the Simple Additive Weighting Method in the Decision Support System determines PPA scholarships for Panca Budi University Students Medan can store data permanently in the database, so that if the data is needed again, the system will search quickly.

b) Application of the Simple Additive Weighting Method in the Decision Support System to determine the PPA scholarship for Panca Budi University Medan Students was made in order to facilitate the process of selecting students who deserve to receive a PPA scholarship.

c) The data submitted will be more accurate because of the validation when inputting data.

2. System Weaknesses

The weaknesses of the system built include:

a) Decision support system that is built does not yet have data backup facilities, so that if there is damage to the server, vulnerable data will be lost.

b) There is no division of tasks for each user, because the application is built for administrators.

c) The data entered is not well coordinated and errors often occur.

d) Storage is more sensitive because it is susceptible to viruses.

VI. CONCLUSION

After analyzing, designing the system and making a decision support system application, determining the PPA scholarship for Panca Budi University Students Medan Using the Simple Additive Weighting Method (SAW), the following conclusions can be drawn:

1. Using the Simple Additive Weighting (SAW) Method can facilitate decision making in determining PPA scholarships for Panca Budi University Medan Students.
2. Decision Support System to determine PPA scholarships for Panca Budi University Medan Students is able to produce alternative design of determining students who are eligible to receive PPA scholarships for Panca Budi Medan Development University students in accordance with the calculation of the Simple Additive Weighting (SAW) method.
3. The resulting output is the total value of the overall weighting criteria of all students who apply for PPA scholarship from Panca Budi University, Medan.

SUGGESTION

The following are suggestions for further development of the application of the Decision Support System Determining PPA scholarships for Panca Budi University Students Medan Using the Simple Additive Weighting (SAW) Method:

1. It is expected that using the Simple Additive Weighting (SAW) method can provide accurate results so that it becomes a recommendation in making decisions about the selection of students who are eligible for PPA scholarships.
2. Decision Support System Determining PPA scholarships for Panca Budi University Students Medan is suggested to be updated more frequently by the admin in the assessment for each period, so as to determine students who are eligible to receive PPA scholarships each period.
3. It is expected that further development of the information system is designed, so that it becomes an integrated information system to cope with and process larger data in the future.

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